

appearances of this aurora could not have been derived from a purely terrestrial, meteorological, or electro-magnetical phenomenon, but that they had a cosmical origin. Hence he has considered that these facts really belong to the domain of a new science, to which he has given the name of "Cosmical Meteorology."

In 1860 Donati published two papers under the title of "Memorie Astronomiche," one on the striæ of stellar spectra, mentioned above, and the second giving an account of his observations of the total eclipse of the Sun, made at Torreblanca, in Spain, in the year 1860. He was elected an Associate of this Society on November 11, 1864.

While on his return-journey from a visit to Vienna in September last, as the representative of his Government at the International Meteorological Congress, held in that city, Prof. Donati was attacked with Asiatic cholera. Although he was very ill at Padua, he was enabled to return to his home and family at Florence, but within a few hours afterwards he succumbed to the disease, deeply regretted by his numerous friends and co-workers in science. His death took place on the early morning (0.30 a.m.) of September 20, 1873, in the forty-seventh year of his age, at his residence, near the new Observatory at Arcetri, which he had laboured so long to establish, and which, it is hoped, will be his appropriate memorial for many generations.

E. D.

MATTHEW FONTAINE MAURY, the distinguished hydrographer, was born in Spottsylvania County, Virginia, on January 14, 1806. He was of French extraction. At an early age his parents removed into the neighbouring State of Tennessee, where young Maury received his education, but he ever retained a deep attachment for his native State. He first obtained a commission in the United States Navy as midshipman on board the *Brandywine*, at the age of sixteen; and in 1825 he was appointed to the *Vincennes* sloop-of-war, which had been commissioned for a four years' voyage, intended to include the circumnavigation of the globe, thus giving him an opportunity of improving his taste for observation in many climes and regions. After the return of the *Vincennes*, Maury served as "master" of the *Falmouth*, a ship stationed in the Pacific. It was during the many leisure hours which occurred on his four years' voyage in the *Vincennes* that he commenced his *Treatise on Navigation*, which afterwards became the adopted text-book on that subject in the United States Navy. After serving for a short time in the *Falmouth*, he was promoted to a lieutenancy on board the frigate *Potomac*, where his great knowledge of seamanship and his great scientific acquirements obtained such notice that he was selected in 1836 to accompany Captain Jones on an exploring expedition as director of the astronomical department. Owing, however, to some unforeseen circumstances, neither Maury nor Captain Jones sailed in the

expedition, both having sent in their resignations before its departure. In 1839, owing to an unfortunate accident, believed to have been a fall from a coach, which resulted in lameness, Lieutenant Maury was compelled to retire from active naval service afloat. The effects of the accident were very serious, and for some time it was feared that the valuable services of this enterprising scientific officer would be permanently lost to his country. The American Government, however, found for him a congenial office by placing him in charge of the depository of naval charts and instruments at Washington. Here his active mind soon succeeded in so re-organising the entire business of the institution that the name of the National Observatory was given to it, which was afterwards changed to the more appropriate designation of Naval Observatory.

Lieutenant Maury had from the time of his entry into the naval service a natural taste for meteorological observations, and more particularly for those relating to the winds and currents; and during his several cruises he made it his frequent occupation to carry out several series of observations, under various circumstances, in order to form a theory of ocean meteorology, with the object of turning it to practical account for the benefit of mariners. When he became the directing mind at the depository of charts and instruments, or more properly the Hydrographic Office, he naturally used his great influence among naval men to recommend the regular observation at sea of the direction of the wind and of ocean currents, as well as other meteorological observations; the observer entering at the time his notes in the log-book, so that they might be available for a subsequent examination at the Observatory. The plan drawn up by Maury in 1842, and generally adopted in the service, included the registration of the direction and force of the wind every eight hours; the direction, velocity, depths, and limits of the various currents; the temperature of the air, of the water on the surface and at various depths, besides other phenomena bearing on the subject of ocean meteorology. In this manner a valuable collection of data was obtained, with the advantage that all the observations were made on one uniform system. The scheme answered so well, that in eight or nine years a sufficient number of observations had accumulated to fill 200 manuscript volumes, each averaging about 2,500 days' observations. It was understood that the master of every vessel, on returning from a voyage, was to deposit the "abstract log" at the Naval Observatory. The pith of this mass of records formed the material upon which Maury's celebrated work on the *Physical Geography of the Sea* was founded.

In this remarkable work Lieut. Maury gives a popular *résumé* of all his investigations relating to ocean meteorology. In the introduction his remarks on its contents explain, in a few words, the object he had in view in presenting the book to the public. "Under the term 'Physical Geography of the Sea,' will be included a philosophical account of the winds and currents of the sea; of the

circulation of the atmosphere and ocean; of the temperature and depth of the sea; of the wonders that lie hidden in its depths, and of the phenomena that display themselves at its surface. In short, I shall treat of the economy of the sea and its adaptations; of its salts, its waters, its climates, and its inhabitants; and of whatever there may be of general interest in its commercial uses or industrial pursuits." This work first appeared in 1855, and it gave an extraordinary stimulus to the study of ocean meteorology; but its great success did not arise altogether from the various theories contained in it—some of which have been objected to, especially that explaining the Gulf Stream—but in a great measure its popularity was owing to the interesting manner with which the driest of meteorological details are arranged and discussed. The work has not only been republished in several editions in England, but it has also been translated into all the principal European languages. Adopting the words of a recent writer: "His unrivalled powers of application and untiring perseverance were combined with rare gifts of imagination, and an almost poetic style. Hence he not only collected materials with judicious discrimination, and arranged them with critical skill, but also combined them so as to produce one of the most fascinating books in the English language."

In 1853 Lieut. Maury represented the United States at the Maritime Conference held at Brussels in that year, for devising an uniform system of meteorological observations at sea. Most of the maritime nations of Europe were also represented at this Conference, including England, France, Russia, Belgium, Holland, Portugal, Denmark, and Norway and Sweden. This international scientific meeting was brought about principally through the exertions of Maury, who was one of its leading members, his advice and labours calling forth from his colleagues an expression of thanks for the enlightened zeal and earnestness he had displayed in the important and useful work which formed the subject of their deliberations. One of the principal results of the Conference was the establishment in 1855 of the Meteorological Department of the Board of Trade, which was placed under the direction of the late Admiral Fitzroy.

When, in 1861, the outbreak of civil war between the Northern and Southern States of America occurred, Captain Maury, like many other high-minded Virginians, threw up his commission in the Navy of the United States, choosing rather to be considered a rebel than to fight against his kinsmen and friends of his native State. No one can doubt that his sacrifice even of professional advancement was great, but his loss to science was greater, by this sudden resignation of his position at the Naval Observatory. But Maury was a Southerner by birth, and his national feeling of honour would not allow him to remain in the service of those whom he considered to be the determined enemies of those most dear to him. Hence on April 19, 1861, he threw in his lot with the Confederate States of the South,

the Government of which he assisted in various ways, especially by his counsel in the construction of its maritime defences, which enabled the South to hold their own so long. During the war his house was destroyed, together with a valuable collection of manuscripts and books; his scientific instruments were confiscated, and he came to Europe on a visit as an impoverished exile. He was received in Europe with every mark of sympathy and respect; and at a banquet given in his honour a valuable testimonial, consisting of a purse containing upwards of 3,000 guineas, was presented to him by Sir J. S. Pakington, in the name of his friends of all nations. While in Europe many attempts were made by more than one Government to attach him to their service, but he remained faithful to his own State till the final overthrow of the South, when he joined the fortunes of the Emperor Maximilian, in Mexico, who appointed him Imperial Commissioner of Emigration. He remained in this office till the fall of Maximilian, when he retired to Virginia, taking the position of a Professor at the College at Lexington. During the last few years of his active life Maury, though in frequent ill-health, exhibited the same devotion and energy in all that he undertook as in his earlier days. One of his latest wishes was to organise a system of combined meteorological reports on land for the benefit of farmers as well as of sailors. He was anxious that his fellow-citizens should discard political animosity, and devote themselves to the development of the agricultural and other resources of their country. He remained thus to the end of life the friend of science and his fellow-man, and he has passed away leaving many warm and attached friends on both sides of the Atlantic. Captain Maury died at Lexington, on the 1st of February, 1873, having a few weeks before completed his sixty-seventh year. He has been an Associate of this Society since January 12, 1855.

E. D.